

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Mechanics of Gas and Fluid Flows		Code 1010634361010632993
Field of study Transport	Profile of study (general academic, practical) general academic	Year /Semester 3 / 6
Elective path/specialty Engineering of Pipeline Transport	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 9 Classes: 9 Laboratory: - Project/seminars: -		No. of credits 1
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 1 100% 1 100%
Responsible for subject / lecturer: prof. dr hab. inż. Andrzej Frąckowiak email: andrzej.frackowiak@put.poznan.pl tel. 616652247 Faculty of Working Machines and Transportation ul. Piotrowo 3 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Students have an understanding of the basics of thermodynamics and fluid mechanics [PRK4]
2	Skills	Strict use of terminology concepts of mechanics, thermodynamics. [PRK4]
3	Social competencies	Working in an interdisciplinary team. Ability to lead a team and knowledge team. [PRK4]
Assumptions and objectives of the course: Learning: phenomena in the flow of real fluids incompressible and compressible through various channels geometrically and applied to different tasks in engineering, physical and mathematical description as the basis for calculations		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. has an extended and deep knowledge of mathematics useful for formulating and solving complex technical tasks concerning various means of transport - [T1A_W01 [P6S_WG]] 2. has extended and in-depth knowledge of physics useful for formulating and solving selected technical tasks, in particular for correct modeling of real problems - [T1A_W02 [P6S_WG]] 3. knows the basic techniques, methods and tools used in the process of solving transport tasks, mainly of an engineering nature - [T1A_W07 [P6S_WG]]		
Skills:		
1. is able to obtain information from various sources, including literature and databases, both in Polish and in English, appropriate to integrate them, make their interpretation and critical evaluation, draw conclusions, and fully justify the opinions they - [T1A_U01 [P6S_UW]] 2. can properly plan and perform experiments, including measurements and computer simulations, interpret the obtained results, and correctly draw conclusions from them - [T1A_U03 [P6S_UW]] 3. can assess the computational complexity of algorithms and transport problems - [T1A_U08 [P6S_UW]]		
Social competencies:		
1. understands that in technology, knowledge and skills quickly become obsolete - [T1A_K01 [P6S_KK]] 2. is aware of the importance of knowledge in solving engineering problems and knows examples and understands the reasons for malfunctioning transport systems that led to serious financial and social losses or to serious health and even life - [T1A_K02 [P6S_KK]]		

Assessment methods of study outcomes		
Exam, final test		
Course description		
The description in the flow of fluids. Similarity number of flows. The equations describing the flow in different channels. The equations of continuity. Energy balance equation. Total pressure losses. Flow through the nozzles under and supersonic. Factors and indicators of the efficiency of movement. Factors and indicators describing the differences in the flow of a perfect fluid and viscous fluid real. Methods and algorithms for computational flows. The similarity of flows? number of similarities flows. Improving the flow in the channels. Ability to solve problems in the flow channels. Algorithms for the calculation.		
Basic bibliography:		
Additional bibliography:		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in the lecture	30	
2. Consultation	3	
3. Preparing to pass	12	
4. Exam	3	
5. Participation in exercises	15	
6. Consolidation of the exercises content	14	
7. Consultations	3	
8. Preparing to pass	6	
9. Final test	3	
Student's workload		
Source of workload	hours	ECTS
Total workload	89	1
Contact hours	89	1
Practical activities	0	0